

A policy for hypertension

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'In no other division of medicine is opinion more confused than in that which deals with the cause and significance of a high blood pressure, and with the progress and treatment of any patient who may exhibit it.' So wrote William Evans in 1957, and it must be admitted that his words are just as true 18 years later, at least so far as the significance and treatment of hypertension are concerned. Thousands of man-hours have been spent during the past few years on symposia and publications debating which individuals with hypertension require treatment and whether populations should be screened. On the one hand, there is widespread enthusiasm for the treatment of mild hypertension, while on the other there are still those who seem to believe that a high blood pressure is best ignored if there is no evidence that it is harming the patient. The truth must lie somewhere between these extremes. It is unthinkable that one-third to one-quarter of men and women in any community should require life-long drug treatment. Yet this is what is implied by the suggestion (*Lancet*, 1975) that all those with a diastolic pressure of 95 mmHg (12.6 kPa) or over should be on antihypertensive therapy; for approximately 30 per cent of men and women between the ages of 35 and 65 in Britain have a diastolic pressure in this range (Hamilton *et al.*, 1954; Miall and Lovell, 1967; Hawthorne, Greaves, and Beevers, 1974). It is equally ridiculous to suggest that a symptomless man with a diastolic pressure of 170 mmHg (22.6 kPa) should be left untreated. This is a time for stocktaking. Though there are important trials in progress, clear results from these are not likely to be available for several years. We must, therefore, make up our minds on a careful consideration of the evidence we have.

New factors to be taken into account

Two major developments affecting our attitude to

hypertension have taken place during the past 20 years. In the first place, there has been a tremendous improvement in the drugs available for treatment. Twenty years ago, antihypertensive therapy was unpleasant and was rightly limited to those with very high pressures. Now, such therapy has become much more tolerable; nevertheless, we must not overlook the fact that all antihypertensive drugs have some side effects.

The other great change that has taken place within the past 20 years is the realization that even mild hypertension is associated with an increased risk of cardiovascular-renal disease (Chicago Society of Actuaries, 1959; Kannel and Dawber, 1974; Miall and Chinn, 1974) and that this risk rises progressively with increasing levels of both systolic and diastolic pressure. It has, however, been clearly shown that the magnitude of the risk is not related solely to the blood pressure level, but is also dependent on the presence or absence of other factors, such as a raised serum cholesterol level, cigarette habit, glucose intolerance, and electrocardiographic evidence of left ventricular hypertrophy. The presence of any one of these factors in addition to hypertension increases the risk of cardiovascular disease; and the greater the abnormality, the greater the risk. For example, a high cholesterol level carries five times the risk of a low one for the same blood pressure. The presence of two factors is worse than one, and three worse than two. In other words, hypertension is one of a number of risk factors, each one of which is graded and which together are cumulative in their effect. There is also clear evidence that the prognosis of hypertension is worse in men than in women (Bechgaard, Kopp, and Nielsen, 1956; Miall and Chinn, 1974) and in those with a positive family history.

The fact that hypertension is dangerous is not in itself a conclusive argument for treatment. We must also have evidence that lowering the blood pressure reduces the risk. Do we have such evidence?

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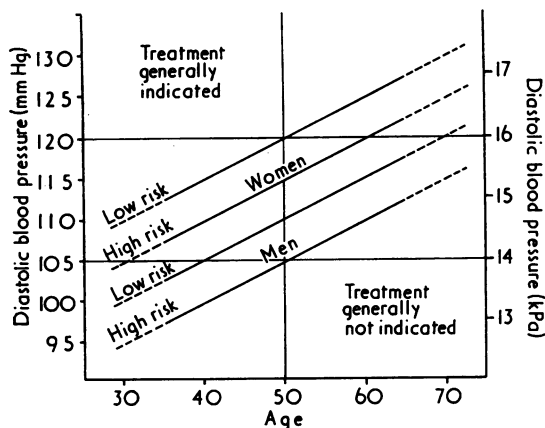


FIG. 1. A guide to the level of diastolic blood pressure requiring treatment at different ages.

Note:

- 1) The pressures referred to are casual fourth phase readings.
- 2) The figure should be regarded only as a guide and not followed slavishly, particularly in situations in which the casual pressure is likely to be unreliable, or in special circumstances such as pregnancy.
- 3) The level of the line for men is based on the most hopeful extrapolation from the evidence of the V.A. Study Group (1970).
- 4) The slope of the lines and the distance between the lines for the two sexes are based on the relative risks at different ages (Bechgaard et al., 1956; Pickering, 1968).
- 5) A simple rule for memorizing the lowest level of diastolic pressure requiring treatment is: 80 mmHg plus half the age (or 10.6 kPa plus one-fifteenth) for men; 5 mmHg (0.7 kPa) higher if there are no associated cardiovascular risk factors; 10 mmHg (1.3 kPa) higher for women.

Value of treatment in mild and moderate hypertension

There is abundant evidence regarding the efficacy of blood pressure reduction in patients with severe hypertension. The difficulty lies in assessing the value of treatment in mild and moderate hypertension. Here, the best evidence at the present time, and probably for some time to come, is that of the Veterans Administration (V.A.) Study Group (1970). This study showed a significant reduction both in morbidity and in mortality in a group of men with diastolic pressures of 105 mmHg (14.0 kPa) or greater given antihypertensive therapy, by comparison with a control group whose pressures

were not lowered. In the case of men with diastolic pressures between 90 (12.0 kPa) and 104 (13.8 kPa) mmHg the evidence of benefit from antihypertensive therapy was suggestive but not conclusive. On the basis of these findings, it has been widely inferred that 'substantial reductions in mortality and morbidity can be expected from effective treatment of mildly raised blood pressure (diastolic 95–110 mmHg (12.6–14.6 kPa))' (Lancet, 1975). Careful study of the evidence, however, shows that this conclusion is ill founded. In the first place, the patients treated in the V.A. study were not a cross-section of the population; they were all men, and their average age was 50; so that the conclusions do not necessarily apply to older patients or to women. But even more important, the hypertension was considerably more severe than indicated by the blood pressure figures stated in the study, because of the way in which the blood pressure was recorded. When we speak of a patient with a diastolic pressure of, for example, 105 mmHg (14.0 kPa) we have in mind someone attending a hospital outpatient clinic or health centre who is found on routine sphygmomanometry to demonstrate muffling of the Korotkow sounds at that level. But that was not the way the V.A. Study Group graded their patients. In the first place, the diastolic pressure was recorded at the point of disappearance of the Korotkow sounds (i.e. the fifth phase). This is not actually stated in any of their reports, and this fact does not appear to have been noted until four years after the publication of the paper (Short, 1974). It is, however, a matter of considerable importance in a context such as this, because the average difference between the fourth and fifth phases is of the order of 7 to 10 mmHg (0.9–1.3 kPa) (Kirkendall et al., 1967). This means that a diastolic pressure of 105 mmHg (14.0 kPa) as given in the V.A. study is equivalent to over 110 mmHg (14.6 kPa) in standard clinical practice.

The other point of equal importance is that in the V.A. study the diastolic pressure by which the hypertension was graded was not taken at the first interview, but only after the patient had become thoroughly familiar with the clinic, its staff, and procedures. Now it is well known that pressures recorded under such circumstances are on average considerably lower than those recorded initially. Dunne (1969) found a mean fall in the diastolic pressure of 8 mmHg (1.1 kPa) between the first outpatient attendance and the third 4 weeks later. Hence, the patients in the V.A. study with a diastolic pressure of 105 to 114 mmHg (14.0 to 15.2 kPa) – the lowest group in which a convincing effect of treatment was demonstrated – correspond to those with ordinary casual fourth phase pressures

of at least 115 to 124 mmHg (15.3 to 16.5 kPa). Thus, there is as yet no conclusive evidence of benefit from treatment in the case of those with such pressures below 115 mmHg (15.3 kPa).

In deciding on a policy for hypertension, it is important not to set too great store by precise blood pressure figures wherever or however recorded; and this for several reasons. In the first place, blood pressure fluctuates widely during the course of a day, and seldom more abruptly than when a person is facing a doctor and his apparatus; casual pressures may, therefore, be very misleading. Secondly, the diastolic pressure is not always easily defined precisely. Thirdly, most doctors have a significant personal error in recording the diastolic pressure. Thus, even a highly experienced clinician such as Tudor Hart (1970) noted that, when tested against the London School of Hygiene Training Tape on blood pressure measurement (Rose, 1965), he had a mean error of +6.3 mm. The systolic pressure is much easier to measure accurately, and is just about as good a guide to prognosis as the diastolic pressure; but unfortunately it is even more susceptible to variation caused by emotional factors (Dunne, 1969). For all these reasons, it still seems reasonable to record the pressure to the nearest 5 mmHg (or 0.7 kPa). Fourthly, the blood pressure is not the only factor responsible for an increased risk of cardiovascular morbidity and mortality; other risk factors have to be taken into account.

Implications for clinical practice

Having considered what seem to the author the most important pieces of evidence, can we now draw some guide lines? So far as the value of treatment is concerned, the hardest evidence we have is that, in general, middle-aged men with a blood pressure (casual, fourth phase) consistently at or above 115 mmHg (15.3 kPa) benefit from treatment. Treatment is badly needed below this level, but there is no proof that it is effective. If there was a completely innocuous tablet that could be taken morning and evening, it would be justifiable to treat patients with blood pressures well below the level at which a beneficial effect has been demonstrated. But all current antihypertensive therapy has not only physical, but also mental, side effects in that it tends to cause anxiety. A policy for treatment must, therefore be based on an estimate of the possible benefit balanced against the probable harm. In general it seems reasonable to aim to reduce the blood pressure of men below the age of 60 who have a level of 110 mmHg (14.6 kPa) or over, provided that this can be done without impairing the patient's feeling of well-being. In the case of men without

additional risk factors, in older men, and in women, the level at which action is taken might reasonably be somewhat higher, and in younger patients somewhat lower (see Fig.). In general, the higher the diastolic pressure and the lower the age, the stronger the case for beginning treatment; and the better the response and the less the side effects, the greater the case for persisting with it. Conversely, the lower the diastolic pressure and the higher the age, the weaker the case for starting treatment; and the less satisfactory the response, and the more troublesome the side effects the weaker the case for persisting with it.

As to whether the blood pressure should be reduced to normal levels, the evidence is conflicting. Taguchi and Freis (1974) found that even partial reduction was beneficial, whereas Beevers *et al.* (1973) did not. A safe rule would be to reduce the pressure to as low a level as the patient can tolerate without developing symptoms in the course of his daily work or recreation.

Implications for screening

This leaves the last and most difficult question: Should populations be screened for hypertension, and if so by whom? There is a strong theoretical justification for health checks which seek for dangerous and remediable defects; and obviously hypertension comes within this category. On the other hand, it is disappointing to find how meagre as a rule are the returns from screening campaigns and how difficult it is to get patients to co-operate in such simple matters as taking tablets, stopping smoking, and reducing weight. In the V.A. study (1970), in spite of having excluded many uncooperative and unreliable patients before the start of the controlled drug trial, no less than 15 per cent abandoned their treatment over the period of approximately four years. Screening for hypertension has its own peculiar difficulties. Many blood pressures recorded under such circumstances are undoubtedly spuriously high and do not represent any risk at all (Evans, 1957). To label such patients as hypertensive, to implant in their minds a fear of strokes and heart attacks, and to condemn them to life-long treatment which may reduce their well-being and even cost them their jobs, would be a tragic mistake. This must be avoided at all costs.

On the other hand, there appears to be a considerable number of men between the ages of 35 and 65 with pressures over 110 mmHg (14.6 kPa) who are either not being treated at all, or at least not treated adequately (Miall and Chinn, 1974), so that there does seem to be a strong case for screening for hypertension, provided that such screening does

not harm those patients for whom treatment is not required. The doctor would have to steel himself to ignore moderately raised pressures associated with nervousness, and in general to 'play it cool'. Blood pressure readings taken by patients in their own homes are usually lower and probably more representative than those recorded in a clinic, and in some centres patients have been trained to do this (Sokolow, Perloff, and Cowan, 1973; Julius *et al.*, 1974); but such an arrangement must carry with it a risk of undesirable and unhealthy introspection and obsession with blood pressure figures. Another means of getting over the problem of the patient who reacts strongly to the doctor's presence is some form of prolonged, semiautomatic recording (Irving *et al.*, 1974), but this would be too time-consuming to be used in routine screening. In keeping with the principle of *non nocere* it would seem that screening for hypertension would best be performed by the family doctor who knows the patient and his family, and that it should be undertaken as part of a general health check without drawing undue attention to the blood pressure. This might best be done as patients are seen for another purpose, for there is evidence that 60 to 70 per cent of patients on a doctor's list are seen annually, and 95 per cent over a five-year period (M. W. Adler, 1975, personal communication). Some individuals with borderline blood pressures would have to be kept under observation. This could be done without worrying the patient by putting a note on his records as a reminder that the blood pressure should be checked routinely at future attendances.

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